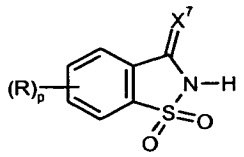
CLAIMS

1. A process for the phosphitylation of an alcohol or thiol with a phosphitylation agent in the presence of an activator, characterised in that the activator has the formula 1:



wherein p is 0 or an integer from 1 to 4, R for each occurrence is a substituent, and X^7 is O or S.

2. A process according to claim 1, wherein X^7 is O and p is 0.

3. A process according to claim 1 or 2, wherein the compound of formula 1 is employed as a salt complex with an organic base.

4. A process according to claim 3, wherein the organic base is selected from the group consisting of pyridine, 3-methylpyridine, and N-methylimidazole.

5. A process according to any preceding claim, wherein the alcohol or thiol is a nucleoside or oligonucleotide comprising a free hydroxy or thiol group.

6. A process according to claim 5, wherein a nucleoside comprising a free 3'-hydroxy group is phosphitylated.

7. A process according to any preceding claim, wherein the phosphitylation agent has the general chemical formula:

$$R^{13}\text{-}X^6\text{-}PX^4X^5$$

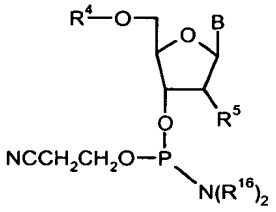
wherein R^{13} represents a phosphorus protecting group, X^6 represents O or S, X^4 and X^5, which may be the same of different, represent leaving groups.

8. A process according to claim 7, wherein R^{13} represents a substituted or unsubstituted aliphatic or aralkyl group or a substituted or unsubstituted aromatic group, X^6 is O and X^4 and X^5 each independently represent $-NR^{14}R^{15}$, wherein R^{14} and R^{15} each

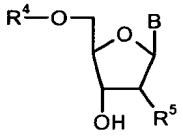
independently represents a C_{1-6} alkyl, group, or R^{14} and R^{15} are joined, together with the N to which they are attached, to form a 5-7 membered ring.

9. A process according to claim 8, wherein the phosphitylating agent is selected from the group consisting of O-β-cyanoethyl-N,N,N',N'-tetraisopropylphosphorodiamidite, O-β-cyanoethyl-N,N,N',N'-tetramethylphosphorodiamidite, O-β-cyanoethyl-N,N,N',N'-tetraethylphosphorodiamidite, bis (N,N-diisopropylamino)-2-methyltrifluoroacetylamino-ethoxyphosphine, bis (N,N-diisopropylamino)-2-diphenylmethylsilylethoxyphosphine and O-β-cyanoethyl-bis (N-morpholino) phosphorodiamidite.

10. A process for the preparation of a compound of formula:



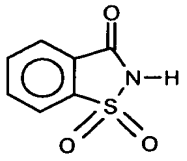
which comprises reacting a compound of formula:



with a compound of formula:

$$NCCH_2CH_2O\text{-}P(N(R^{16})_2)_2$$

in the presence of an activator, where the activator comprises a compound of formula:



and an organic base, wherein R^4 is an alcohol protecting group, R^5 is -H, -F $-OR^6$, $-NR^7R^8$, $-SR^9$, or a substituted or unsubstituted aliphatic group, such as methyl or allyl, R^6 for each occurrence is -H, a substituted or unsubstituted aliphatic group, a substituted or unsubstituted aryl group, a substituted or unsubstituted aralkyl, an alcohol protecting

group, or $-(CH_2)_q-NR^{11}R^{12}$, R^7 and R^8 are each, independently, -H, a substituted or unsubstituted aliphatic group, or an amine protecting group or R^7 and R^8 taken together with the nitrogen to which they are attached are a heterocyclyl group, R^9 is -H, a substituted or unsubstituted aliphatic group, or a thiol protecting group, R^{11} and R^{12} are each, independently, -H, a substituted or unsubstituted aryl group, a substituted or unsubstituted heteroaryl group, a substituted or unsubstituted aliphatic group, a substituted or unsubstituted aralkyl group, a substituted or unsubstituted heteroaralkyl group or an amine protecting group or R^{11} and R^{12} taken together with the nitrogen to which they are attached form a heterocyclyl group, q is an integer from 1 to about 6, B is -H, a natural or unnatural nucleobase, protected nucleobase, protected natural or unnatural nucleobase, heterocycle or a protected heterocycle and R^{16} represents a C_{1-6} alkyl group, preferably an isopropyl group.

11. A process according to claim 10, wherein the organic base is selected from the group consisting of pyridine, 3-methylpyridine, and N-methylimidazole.

12. A process according to claim 10 or 11, wherein R^5 is H, OMe or OCH_2CH_2OMe.

13. A process according to claim 10 or 11, wherein R^4 is an acid-labile protecting group and R^5 is OR^6 wherein R^6 is a base labile protecting group or a silyl protecting group.